

2003 Annual Report
for
NOAA Fisheries Permit 1233

The Incidental Take of ESA Listed Salmon and Steelhead
During Conduct of
Recreational Fisheries in Idaho

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INTRODUCTION

On December 6, 2002 the National Oceanic and Atmospheric Administration Fisheries Service (NOAA Fisheries) issued the Idaho Department of Fish and Game (Department) Permit Number 1233 under authority of Section 10(a)(1)(B) of the Endangered Species Act (ESA) for the incidental take of listed species associated with the conduct of recreational fishing programs. Permit 1233 establishes annual reporting requirements, and this document provides the required information for Idaho's 2003 recreational fisheries.

ITEMS 1, 6 & 7 DESCRIPTION OF ACTIVITIES, ESTIMATES OF TAKE & CREEL SURVEY RESULTS

Recreational salmon and steelhead fisheries in Idaho were conducted as proposed by the Department.

Chinook and Steelhead Creel Survey and Check Station Data

Results of creel surveys, and check station operations are provided separately for each fishery. In addition to catch and effort information, the Department sampled chinook and steelhead for the presence of coded microwire tags, PIT tags, and for biological data. Tag recovery data will be reported to the Pacific States Marine Fisheries Commission as established by inter-state, and international protocols. Length and sex data will be reported as required under various contracts and cooperative agreements. Copies of these reports can be obtained from the Department about one year from completion of field sampling.

Spring Chinook Salmon Run Size

For the spring run (March 1 – June 17) a total 70,609 adult chinook were counted over Lower Granite Dam, of which 44,013 did not have an adipose fin, and 26,596 had an adipose fin. We estimate that about 0.05 of the hatchery-origin chinook that were supposed to be adipose fin clipped were not. Therefore, the actual number of adults crossing lower Granite Dam that were of hatchery origin and supposed to have been fin clipped is 46,329 ($46,329 = 44,013 / 0.95$). The estimated number of wild/natural spring chinook adults is 24,280 ($24,280 = 70,609 - 46,329$).

Lower Salmon River Chinook Salmon Fishery

The Lower Salmon River fishery opened April 26 and closed June 22. Fishing was allowed every day. We estimated that 765 adipose fin clipped chinook salmon were harvested (Table 1).

In our application we outlined two methods that could be used to estimate the number of unlisted, mis-clipped hatchery fish versus the number of listed fish that were reported to have had an adipose fin when released. The method that uses estimates of the abundance of listed fish, and hatchery fish passing through the fishing area to estimate the proportion of the fish with adipose fins released by anglers that were listed estimated that 438.5 listed fish were released. The method that used the ratio of mis-clipped to fully clipped fish released at Rapid River estimated that 258.7 listed fish were released. Considering that these two methods produced similar results and that there is no compelling reason to believe one method or the other produces more accurate estimates, we averaged the daily estimates. The average of the two methods is 348.6. If 0.1 of the estimated number of listed fish released died then 35 listed fish may have died. Pre-season, I estimated that about 36-68 listed fish may die as a result of being incidentally caught and released. For an adult spring chinook run size of 24,280, Permit 1233 authorizes an incidental mortality of 0.015 of the run, or 364 fish.

Little Salmon Chinook Salmon Fishery

The Little Salmon fishery opened April 26 and closed August 3. Fishing was allowed every day. Anglers spent an estimated 76,908 hours to harvest 3,117 adult, and 98 jack chinook salmon (Table 2). We estimated that 585 unclipped adult chinook salmon were caught and released.

Of the 585 adult unclipped salmon caught and released we estimated that about 177 might have been listed. At a 10% mortality rate, 18 listed adults may have died. Pre-season, we estimated that about 5 listed fish may die as a result of being incidentally caught and released.

Total Spring Chinook Incidental Mortality

Permit 1233 authorizes an incidental mortality of 8 listed adults when fishing in the Little Salmon River (regardless of the run size over Lower Granite Dam), and an additional 364 for all spring chinook recreational fisheries for a total of 372. The total incidental mortality of 53 spring chinook adults ($53 = 35 + 18$) is 14% of that allowed by Permit 1233.

Upper Snake River Chinook Salmon Fishery

Pre-season we forecasted that about 500 spring chinook would return to the Oxbow Trap located at the face of Hells Canyon Dam. Fishing was allowed from Dug Bar, located about 6 miles upstream from the mouth of the Imnaha River, to Hells Canyon Dam from April 25 to August 4. The department did not conduct creel surveys in this area, and no estimates of harvest are available.

Table 1. Harvest and incidental mortality of listed Chinook salmon for the Lower Salmon River fishery, 2003.

Begin Date Census Interval	End Date	Effort Hours	Estim. harvest Adults	Marked and released		Un-marked and released		Based on Estimated Return of Wild Fish Through area			Based on Rapid River Mis-clipped Rate			Avg No Listed Fish Released	Avg. Est Mortality
				Adults	Jacks	Adults	Jacks	Number Listed Adult Fish Released	Estimated Mortality Adult Listed Fish	Estimated Cumulative Mortality Adult Listed Fish	Number Listed Adult Fish Released	Estimated Mortality Adult Listed Fish	Estimated Cumulative Mortality Adult Listed Fish		
4/26	5/2	1535	29	5	0	24	0	22.1	2.2	2.2	19.2	1.9	1.9	20.6	2.1
5/3	5/9	6852	87	34	0	53	0	48.7	4.9	7.1	21.6	2.2	4.1	35.2	3.5
5/10	5/16	17909	283	73	0	210	0	193.1	19.3	26.4	128.7	12.9	17.0	160.9	16.1
5/17	5/23	6660	59	0	20	59	0	54.2	5.4	31.8	50.8	5.1	22.0	52.5	5.3
5/24	5/30	1078	0	0	0	0	0	0.0	0.0	31.8	-1.2	-0.1	21.9	-0.6	-0.1
5/31	6/6	104	0	0	0	0	0	0.0	0.0	31.8	0.0	0.0	21.9	0.0	0.0
6/7	6/13	1726	4	0	13	4	0	3.7	0.4	32.2	-5.0	-0.5	21.4	-0.7	-0.1
6/14	6/20	6623	243	133	559	110	50	101.1	10.1	42.3	40.1	4.0	25.4	70.6	7.1
6/21	6/22	3287	60	43	69	17	0	15.6	1.6	43.9	4.4	0.4	25.9	10.0	1.0
	Total	45,774	765	288	661	477	50	438.5	43.9	43.9	258.7	25.9	25.9	348.6	34.9

Table 2. Fishing effort, catch, and harvest estimates for the 2003 spring chinook salmon fishery on the Little Salmon River, Idaho (Janssen 2003).

Creel Dates	Angler Hours (+/- 95% CI)	Total Catch (+/- 95% CI)	Adults Harvested	Jacks Harvested	Clipped Adults Released	Unclipped Adults Released	Clipped Jacks Released	Unclipped Jacks Released	Unknown if Clipped Jacks Released
4/26-27/03	186	0	0	0	0	0	0	0	0
4/28-5/4	726	29	29	0	0	0	0	0	0
5/5-5/11	3991	194	181	3	0	10	0	0	0
5/12-5/18	15536	954	787	0	71	96	0	0	0
5/19-5/25	13823	636	510	8	13	97	4	4	0
5/26-6/01	1625	28	19	0	0	0	9	0	0
6/2-6/08	2580	74	37	15	4	11	7	0	0
6/9-6/15	3795	334	114	20	56	34	102	4	4
6/16-6/22	12491	933	471	39	135	79	174	13	22
6/23-6/29	13091	982	527	13	109	192	109	13	19
6/30-7/06	7884	601	419	0	89	66	19	4	4
7/7-7/13	708	27	20	0	7	0	0	0	0
7/14-7/20	309	6	3	0	3	0	0	0	0
7/21-7/27	84	0	0	0	0	0	0	0	0
7/28-8/3	79	0	0	0	0	0	0	0	0
TOTALS	76908	4798	3117	98	487	585	424	38	49

South Fork Salmon River Chinook Fishery

The South Fork of the Salmon River chinook fishery opened June 18 and closed July 16. A mandatory check station was operated for a portion of each day to estimate the catch and incidental mortality. An estimated 15,414 anglers reported fishing for 81,926 hours. We estimated that 4,158 adult un-clipped chinook were caught and released. The method used to estimate the number of listed adult chinook caught and released that were bound for the weir is described in IDFG (2003). We estimated that 0.7543 (3,136 adults) of the 4,158 unclipped adults caught and released were listed. If the mortality rate on these fish is 10%, then about 314 ESA listed adults died. In addition, we estimated that about 6 ESA listed adults may have been illegally retained. The estimated total mortality of ESA listed fish was 320. We estimated that 0.079 of the 320 listed adults (25 adults) were bound for the area between Goat Creek and the Trap. Therefore the projected total number of ESA listed adults bound for the trap is 295 (Table 3).

In 2003, 2,234 listed summer chinook were trapped at the South Fork weir. In addition to the fish that are trapped, some fish may pass the weir site prior to when it is installed, or may pass through the weir uncounted. Using carcass survey data, we estimated that 170 listed adults passed the weir uncounted in 2003. The total estimated escapement of listed adults above the weir was 2,404 ($2,404 = 2,234 + 170$).

NOAA Fisheries Biological Opinion for the fisheries of the South Fork of the Salmon River (NMFS 2000) established a sliding scale for the allowable take of listed adult chinook based on the number of listed adults counted at the weir. For a run size of 2,404 adult fish, the allowable incidental mortality is 664 $\{664 = (0.12 * 773) + (0.35 * (2,404 - 773))\}$. The estimated mortality of the 295 listed adults bound for the trap is about 44% of the total allowable mortality.

Table 3. Harvest of fish caught and released, and incidental mortality of listed chinook salmon for the South Fork of the Salmon River chinook fishery, 2003.

South Fork Salmon River Chinook Fishery 2003 -- Total Daily Fishery Estimate															
DATE	RESERVE FISH HARVESTED					NUMBER OF RECYCLED FISH THROUGH STATION	FISH RELEASED ON DAY OF INTERVIEW ONLY				ILLEGAL HARVEST OF LISTED FISH		SLM FINAL 4-30-04 0.7543 x unmarked adults reported released x 0.1 mortality rate	Total Estimated Lethal Take of Adults	LISTED Fish BOUND for Weir =0.921 (rest bound for area between Goat Crrek & Trap)
	ADULTS CAUGHT TODAY	JACKS CAUGHT TODAY	TOTAL TODAY	TOTAL FOR ALL FISH THROUGH STATION	TOTAL FOR ALL ADULTS THROUGH STATION		AD CLIP ADULTS	AD CLIP JACKS	UN-AD CLIP ADULTS	UN-AD CLIP JACKS	ADULT	JACK			
06/18/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/19/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/20/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/21/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/22/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/23/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/24/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/25/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/26/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0
06/27/03	0.00	0.00	0.00	0.00	0.00	0.00	0.00	6.45	0.00	0.00	0.00	0.00	0.00	0.00	0
06/28/03	2.99	0.00	2.99	2.99	2.99	0.00	0.00	7.94	0.00	0.00	0.00	0.00	0.00	0.00	0
06/29/03	32.58	0.00	32.58	32.58	32.58	0.00	0.00	0.00	9.09	0.00	0.00	0.00	0.69	0.69	0.631555
06/30/03	36.69	1.49	38.18	38.18	36.69	0.00	1.49	2.99	13.43	0.00	0.00	0.00	1.01	1.01	0.933193

Table 3 Continued. Harvest of fish caught and released, and incidental mortality of listed chinook salmon for the South Fork of the Salmon River chinook fishery, 2003.

South Fork Salmon River Chinook Fishery 2003 -- Total Daily Fishery Estimate																
DATE	RESERVE FISH HARVESTED					NUMBER OF RECYCLED FISH THROUGH STATION	FISH RELEASED ON DAY OF INTERVIEW ONLY				ILLEGAL HARVEST OF LISTED FISH		SLM FINAL 4-30-04 0.7543 x unmarked adults reported released x 0.1 mortality rate	Total Estimated Lethal Take of Adults	LISTED Fish BOUND for Weir =0.921 (rest bound for area between Goat Crrek & Trap)	
	ADULTS CAUGHT TODAY	JACKS CAUGHT TODAY	TOTAL TODAY	TOTAL FOR ALL FISH THROUGH STATION	TOTAL FOR ALL ADULTS THROUGH STATION		AD CLIP ADULTS	AD CLIP JACKS	UN-AD CLIP ADULTS	UN-AD CLIP JACKS	ADULT	JACK				
07/01/03	47.76	7.94	55.70	68.60	60.66	8.96	7.94	1.49	31.34	0.00	0.00	0.00	2.36	2.36	2.17745	
07/02/03	83.58	7.94	91.53	105.92	97.98	7.46	33.32	0.00	35.82	1.49	0.00	0.00	2.70	2.70	2.488515	
07/03/03	200.00	9.48	209.48	325.41	315.93	33.33	94.33	6.06	54.55	0.00	3.55	0.00	4.11	7.66	7.058879	
07/04/03	204.55	4.48	209.03	244.85	240.37	35.82	120.52	22.91	197.16	13.43	0.00	0.00	14.87	14.87	13.6972	
07/05/03	365.15	27.27	392.42	525.00	488.64	39.39	203.03	60.61	240.91	6.06	0.00	0.00	18.17	18.17	16.7362	
07/06/03	240.00	16.42	256.42	322.09	305.67	17.91	203.58	29.85	356.72	4.48	1.42	0.00	26.91	28.33	26.08928	
07/07/03	212.90	33.72	246.62	299.71	262.95	9.09	164.91	68.23	112.22	0.00	0.00	0.00	8.46	8.46	7.795765	
07/08/03	236.78	15.41	252.19	315.31	295.43	16.42	179.92	39.24	274.00	4.48	0.71	0.00	20.67	21.38	19.68904	
07/09/03	232.30	27.35	259.65	304.86	267.07	32.84	303.81	75.06	338.18	23.88	0.00	0.00	25.51	25.51	23.49352	
07/10/03	418.39	17.91	436.30	473.09	453.68	45.02	294.27	23.88	248.53	4.48	0.71	0.00	18.75	19.46	17.91965	
07/11/03	416.90	13.43	430.33	471.59	456.66	35.85	210.69	17.91	364.95	4.48	0.00	0.00	27.53	27.53	25.35323	
07/12/03	364.30	33.71	398.01	440.67	406.97	56.41	285.57	36.07	498.88	1.49	0.00	0.00	37.63	37.63	34.65775	
07/13/03	393.51	39.33	432.84	522.99	479.18	40.30	276.42	55.22	460.00	4.48	0.00	0.00	34.70	34.70	31.95667	
07/14/03	317.04	34.58	351.62	382.59	348.01	5.97	124.13	35.20	238.43	4.48	0.00	0.00	17.98	17.98	16.56417	
07/15/03	201.24	51.87	253.11	281.09	227.74	11.94	137.56	32.21	266.79	0.00	0.00	0.00	20.12	20.12	18.53425	
07/16/03	88.00	14.00	102.00	141.00	120.00	0.00	137.00	18.00	251.00	2.00	0.00	0.00	18.93	18.93	17.43723	
07/16/03	117.00	16.00	133.00	140.00	123.00	25.00	99.00	4.00	166.00	6.00	0.00	11.79	12.52	12.52	11.53219	
07/17/03	0.00	0.00	0.00	12.00	12.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0	
TOTALS	4,211.67	372.33	4,584.00	5,450.52	5,034.19	421.70	2,877.50	543.33	4,158.00	81.22	6.39	11.79	313.64	320.03	294.75	

Steelhead Fishery – Fall 2002 and Spring 2003

Steelhead bound for Idaho enter the Columbia River from about June 1 through October 1 each year, but a portion of the run spends the winter in the Columbia and Snake rivers downstream of Lower Granite Dam, and migrate into Idaho in the spring of the following year. Recreational fisheries begin in the fall each year, and are allowed to continue until spring. To facilitate analysis and reporting, information on run size, harvest and incidental take of listed species is pooled across a calendar year to create a “run year”. This report includes data on the run size for fish that crossed Lower Granite Dam in the summer of 2002 through the spring of 2003, and the harvest during these seasons.

Seasons, locations, and other rules for steelhead fishing are described in IDFG (2002). Creel surveys were conducted primarily to estimate catch rate, to recover tags and collect biological data. Creel survey data are reported for each year when the data analysis is completed, and reports may be obtained from the Department upon request.

The number of steelhead counted over Lower Granite Dam for the 2002 run year was 221,935. Sampling was conducted during the fall of 2002 to estimate the number of hatchery and wild/natural-origin fish in the run. Of the estimated 206,131 steelhead that migrated in the fall, 40,031 were estimated to be wild/natural origin fish, and 166,100 were estimated to be hatchery origin. The spring run of 15,804 was not sampled. We assumed that the same proportion of wild/natural and hatchery origin fish migrated over Lower Granite Dam in the spring of 2003 as migrated over the dam in the fall of 2002. We estimated that the spring component of the run was composed of 3,070 wild/natural origin fish and 12,734 hatchery origin adults. The total run was composed of 43,101 wild/natural-origin fish and 178,834 hatchery-origin fish.

The wild/natural run was composed of 14,198 “B” run and 28,903 “A” run fish. If 65% of the “A” run, and all the “B” run fish counted over Lower Granite Dam (Marshall 2001a) entered Idaho, then 32,985-wild/natural steelhead entered Idaho. On average, 87.4 percent of the hatchery-origin steelhead counted over Lower Granite Dam are bound for Idaho (Marshall 2002b). Using this average, we estimated that 156,301 hatchery-origin steelhead entered Idaho during the 2003 run year.

The Department’s estimates the number of steelhead harvested each year by a telephone survey. McArthur (unpublished data) estimated 82,992 hatchery-origin steelhead were harvested in Idaho in the fall of 2002 and spring of 2003. If 156,301-hatchery steelhead entered Idaho, then the harvest rate for the 2003 run year was 0.531. This rate is slightly higher than the average harvest rate 0.46 for the years 1990-1996 (Marshall 2002b).

To estimate the number of wild/natural steelhead that were caught and released, we assumed that the encounter rate on wild/natural steelhead was the same as hatchery-origin steelhead. To estimate the encounter rate on hatchery steelhead, we divided the harvest rate of 0.531 by the proportion of hatchery steelhead (0.723) that are caught and kept (Marshall 2001a). For the 2003 run year, I estimated that $0.734 (0.531 / 0.723 = 0.734)$

of the 32,985 wild steelhead or 24,211 fish were caught and released. If 0.05 of the wild steelhead that were caught and released died, then 1,211 wild/natural origin listed steelhead may have died. A mortality of 1,211 fish represents 3.7 % of the 32,985-wild/natural steelhead entering Idaho, as discussed in Marshall (2001a), this estimate is likely biased high.

In the fall 2002 steelhead fishery, creel survey staff checked 655 anglers who fished 4,998 hours on the Snake River from Lewiston to the mouth of the Salmon River. These anglers reported they caught and released a total of 6 chinook, of which three were adults and 3 were jacks. On average one adult chinook was caught and released for every 1,666 hours fished. Phone Survey (McArthur unpublished data) of fall steelhead anglers indicates that anglers spent a total of 14,856 days angling. Based on an average of 6 hours fished each day, the total number of hours fished was 89,136. If one adult fall chinook was caught and released for every 1,666 hours fished, then 54 adult fall chinook were caught and released in the lower Snake River steelhead fishery in the fall of 2002.

In the fall 2002 steelhead fishery, creel survey staff checked 1,714 anglers who fished 7,130 hours on the Clearwater River from Lewiston to Orofino. These anglers reported they caught and released 30 fall chinook of which 17 were adults, and 13 were jacks. On average one adult fall Chinook was caught and released for every 419 hours fished. Our annual Phone Survey of fall steelhead anglers indicates that anglers spent a total of 52,501 days angling. Based on an average of 6 hours fished per day, a total of 315,006 hours were spent fishing on this section of the Clearwater River. If one adult fall chinook was caught and released for every 419 hours fished, then 752 adult fall chinook were caught and released in the lower Clearwater River steelhead fishery in the fall of 2002.

A total of 806 adult fall chinook salmon were estimated to have been incidentally caught and released by steelhead fishermen in Idaho during the fall of 2002. If the mortality rate for adult fall chinook incidentally caught and released by steelhead anglers is 0.1, then 81 adult fall chinook may have died. Permit 1233 provides that up to 20 threatened fall chinook may be caught and released each year of which 2 may die. In 2002, 11,724 adult fall chinook were counted over Lower Granite Dam. Each year TAC makes an estimate of the proportion of the fall chinook run counted over Lower Granite Dam that is bound for Idaho, and that is listed under the ESA. Preliminary data indicates that 3,895 (33.2%) of the adult fall chinook estimated to have migrated over Lower Granite Dam in 2002 were ESA listed. If the incidence of ESA listed fall chinook caught and released is the same as the incidence estimated to have migrated over Lower Granite Dam, then 268 of the 806 adult fall chinook caught and released were listed. If 0.1 of the fish incidentally caught and released die, then 27 ESA listed adults may have died.

An incidental catch and releases of 268 of the 3,895 ESA listed fall chinook estimated to have migrated over Lower Granite Dam translates to an encounter rate of 0.069 and (at a 0.1 mortality rate) a mortality rate of 0.007. Permit 1233 currently authorizes that no more than 20 ESA listed fall chinook may be caught and released. On March 4, 2004 IDFG submitted a request to modify permit 1233, and among other changes, requested

that the numerically fixed encounter rate developed when run sizes of fall chinook were very low, be changed to 0.015. However, this requested modification was developed without the benefit of run reconstruction data and harvest data to bracket likely incidental impacts that were actually occurring. Based on these data, it appears that an encounter rate of about 0.07 is a more realistic value.

General Fishing Regulations

While it is possible that fishermen angling under Idaho's General Fishing Regulations caught listed salmon, regional staff reported no incidents in 2003.

Redfish Lake Kokanee Fishery Implementation and Monitoring

To help offset intra-specific competition in Redfish Lake between resident kokanee and supplemented sockeye salmon juveniles, the kokanee fishery was reopened in 1995. In accordance with NOAA Fisheries special conditions, the Department conducted the following activities:

- 1) A roving, stratified creel survey with angler interviews;
- 2) Enforcement spot checks on the water and at access points;
- 3) Collection of fin samples from kokanee observed in the creel for mitochondrial DNA analysis;
- 4) Posted signs and circulated news releases to alert anglers to the presence of adipose fin-clipped hatchery sockeye salmon in Redfish Lake and;
- 5) Provide public information programs regarding the importance of protecting ESA-listed Snake River sockeye salmon.

Results from the 2003 Creel Survey on Redfish Lake

Interviews were conducted with 179 anglers in 2003 and an estimated 424 kokanee were harvested in 2,477 hours of fishing. Angler effort was lower than the average effort estimated for 1996 to 2001 (3,717 hours).

The 2003 incidental take of unmarked sockeye was estimated at 1 fish. Permit 1233 allows for incidental take of 34 naturally produced (unmarked) Snake River sockeye salmon. The 2003 estimate of incidental take assumes that the proportion of residual sockeye salmon to kokanee recruiting to the sport fishery (age 2+ and older) is 0.003 (estimated from mitochondrial DNA analysis conducted since 1996 on angler harvested kokanee). If 0.003 of the *O. nerka* harvested during the 2003 fishery were listed, then one listed fish was caught. Five hatchery-produced sockeye salmon (adipose-clipped) were caught and released.

The estimate of incidental take assumes residual sockeye and resident kokanee populations are equally distributed in the lake and are equally vulnerable to the fishery, but this assumption is likely false. The majority of angling effort occurs on the north end of the lake where kokanee stage prior to spawning in late July and early August whereas, residual sockeye stage and spawn at Sockeye Beach at the southern end of the lake in late

October. In addition, because the fishery closes between August 7 and January 1, residual sockeye are protected when they schooling prior to spawning.

The kokanee fishery in Redfish Lake was reestablished to help reduce intra-specific competition by removing spawning age kokanee from the population, which would also reduce juvenile recruitment. Kokanee spawning in Redfish Lake is confined to a limited section of Fishhook Creek, and this facilitates estimating the number of fish spawning (activity performed by Shoshone-Bannock Tribes). The estimated impact of angler harvest on adult kokanee from 1996 to 2003 has ranged from 0% to 53% of total escapement.

Tissues for genetic analysis were collected from 31 of the 92 kokanee observed during creel surveys. These samples will be delivered to the University of Idaho, Hagerman Fish Culture Experiment Station for mitochondrial DNA analysis. Of the 378 fin samples analyzed from angler-harvested kokanee on Redfish Lake since 1996, only one sample has produced a haplotype unique to residual sockeye salmon (0.3%).

ITEM 2 MEASURES TAKEN TO MINIMIZE DISTURBANCE TO LISTED FISH

The primary disturbance to listed salmon and steelhead caused by recreational fishing is incidental catch and release by anglers targeting un-listed fish. To minimize the disturbance to listed adult fish, the Department requires the use of barbless hooks, and requires that fish without evidence of healed scare on their adipose fins be released immediately. Anglers fishing under Idaho's General Regulations may encounter juvenile listed fish. Protective regulations that minimize the disturbances to listed fish vary and are summarized in IDFG 2002.

ITEM 3 UNFORESEEN PROBLEMS

No unforeseen problems were reported during conduct of recreational fisheries in 2003. The only unforeseen effect on listed species was the higher than permitted encounter of fall chinook during the steelhead fishery

ITEM 4 SUMMARY OF LAW ENFORCEMENT AND PUBLIC EDUCATION EFFORTS

The Department maintains law enforcement staff in each regional office. Staff is assigned patrol duties on a priority basis. Law enforcement staff patrol the recreational fisheries both in uniform, and in plain clothes. In addition Department biological staff are authorized to enforce fishing regulations. The combined presence of enforcement

officers, and biological staff conducting creel surveys provides excellent monitoring.

The Department maintains a proactive public education program to enhance the protection of listed fish, and to ensure compliance with protective regulations. Among the activities are summarized below.

- 1) An aquatic education program for school age children.
- 2) Publication of information on Idaho's threatened and endangered species, including where they may be encountered, and species identification guides in our Fishing Season and Rules.
- 3) Discussions with anglers on these subjects when fishing, when at check stations, and other times and places.
- 4) Regional activities include posting of signs, issuing news releases, and participating in radio programs.

The low incidence of serious violations that would adversely impact listed fish confirms that both the public education, and enforcement activities conducted by the Department work effectively.

ITEM 6 MEASURES TAKEN TO REDUCE DELIBERATE ILLEGAL TAKE

In addition to law enforcement measures taken, creel survey crews, check station operations, our Citizens Against Poaching program provide a significant deterrent to deliberate illegal take of listed species.

ITEM 8 STEPS THAT HAVE BEEN OR WILL BE TAKEN TO REDUCE IMPACTS OF RECREATIONAL FISHERIES ON LISTED SPECIES

Steps taken to reduce impacts on listed species are described in Permit 1233, and annual pre-season notice of proposed fisheries. Steps that will be taken each year are detailed in pre-season notice of proposed fisheries. At this time no new measure have been identified to reduce impacts to listed fish.

REFERENCES CITED

- IDFG. 2002. Idaho 2002 and 2003. Fishing Seasons and Rules Including Steelhead. Idaho Department of Fish and Game, Boise. 72 p.
- IDFG. 2003. Proposal to Conduct Recreational Fisheries in 2003 for Unlisted McCall Hatchery Summer Chinook Salmon in Idaho. Idaho Department of Fish and Game, Boise. 15 pgs.
- Janssen, P. 2003. Little Salmon River, Idaho Spring Chinook Salmon *Oncorhynchus tshawytscha* Sport Harvest Report. Draft Report Idaho Department of Fish and Game, Boise.
- Marshall, S. 2001a. Estimates of the Incidental Mortality of Wild Steelhead Caught and Released by Idaho Anglers, and Recommendations for Establishing Annual Take Limits Under Section 10 (a) (1) (B) of the Endangered Species Act. IDFG unprocessed report. Boise, ID. 23p.
- Marshall, S. 2002b. Letter to Herb Pollard, NMFS. January 14, 2002.
- National Marine Fisheries Service. 2000. Endangered Species Act – Section 7 Consultation. Biological Opinion. Impacts of Treaty Indian and Non-Indian Fisheries in the Snake River Basin in year 2000, on Salmon and Steelhead Listed Under the Endangered Species Act. NMFS, Portland, OR. 62 pg.
- McArthur, T.J. 2003. Telephone Survey Estimates Steelhead Harvest in Idaho for the Fall 2002 and Spring 2003 Fisheries. Unpublished Data. IDFG, Boise.